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Physicochemical and Microbiological Variations in Rivers on the Foothills of Mount Meru, Tanzania.

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Abstract

Little is known on the physicochemical and microbiological changes in Nduruma, Tengeru and Maji ya Chai Rivers. Such important variations were studied during wet and dry seasons in 2015. Water samples from various predetermined points of the rivers were analyzed for major physicochemical and microbial contents using APHA standard methods. Pollution levels in Tengeru River were lower than those of Nduruma and Maji ya Chai Rivers. The fecal coliforms were found in all water samples whereas other parameters were found to be within the WHO maximum permissible limits in most samples. Few samples had BOD, nitrates and total soluble phosphates levels higher than the WHO of 10 mg/l, 50 mg/l and 0.1 mg/l, respectively. Most areas in wet season recorded COD levels higher than the WHO recommended values of 10 mg/l. Few areas in the dry season had EC of up to 1722 µS/cm which is above the WHO maximum recommended level of 500-1500 µS/cm. The stable isotopes studies in water samples revealed sources of DOC in Nduruma River was from plant materials and soil composite with its nitrates being mainly from urea fertilizers applied by farmers. Ground water was the main source of DOC in headwater of Tengeru while manure was its main source in the floodplain with its nitrates originating from animal manure.DOC in Maji ya Chai River originated from plant materials whereas the nitrates was from wild animal manure. The observed severe degradations of the riparian environment of the rivers call upon immediate rehabilitation measures

KEYWORDS: physicochemical changes, microbiological properties, Nduruma River, Tengeru River, Maji ya Chai River, stable isotopes, pollutant sources.